## REMARKS

A total of 15 claims remain in the present application. The foregoing amendments are presented in response to the Office Action mailed January 10, 2005, wherefore reconsideration of this application is requested.

By way of the above-noted amendments, claims 1 and 11 have been amended to more clearly define features of the present invention. In particular, these claim have been amended to clarify that the stream of successive sample values representative of the desired E-field, are digital samples which provide a complete definition of the desired E-field, rather than merely one component of it. Thus, claims 1 and 11 have been amended to define that the drive signals are "based on a stream of successive digital sample values representative of In-Phase and Quadrature components of a desired optical E-Field". Claims 2, 3, 9, 12 and 13 have been amended to reflect the revisions effected in claims 1 and 11, and claims 2 and 15 amended to address the informality identified by the Examiner.

In preparing the above-noted amendments, careful attention was paid to ensure that no new subject matter has been introduced. In particular, FIG. 4 and the accompanying description clearly teach that the digital filter 26 generates a stream of digital samples I(n) and Q(n), which at paragraph 31 teach that "the digital filter 26 generates successive sample values I(n) and Q(n), which represent the desired E-Field in Cartesian (In-phase and Quadrature) coordinates" The person of ordinary skill in the art will immediately recognise that this teaching is fully equivalent to the "... stream of successive digital sample values representative of In-Phase and Quadrature components of a desired optical E-Field" as provided in amended claims 1 and 11.

Referring now to the text of the Office Action:

- claims 2 and 15 have been objected to as informal;
- claims 1, 2 and 11 stand rejected under 35 U.S.C. § 103(a), as being unpatentable over the teaching of United States Patent Application No. 2003/0228081

(Tavlykaev) in view of United States Patent Application No. 2004/0096137 (Risser et al.); and

- claims 3-10 and 12-15 stand objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form.

As an initial matter, applicant appreciates the Examiner's indication of allowable subject matter in claims 3-10 and 12-15. The Examiners rejection of claims 1, 2 and 11 is believed to be traversed by the above-noted claim amendments, and further in view of the following discussion.

Both United States Patent Applications Nos. 2003/0228081 (Tavlykaev) and 2004/0096137 (Risser et al.) teach optical devices based on the well known Mach-Zehnder interferometer configuration. As is well known in the art, the respective branches of the MZ-interferometer can be driven by separate drive signals, which can be either correlated or uncorrelated (i.e. differing in both amplitude and/or phase – see Tavlykaev, para. 45).

IT is also well known that such optical devices exhibit an optical response to the applied input voltage, and that this response is capable, for example, of driving a phase shift through more than 180°. The voltage increment required to cause a 180° phase shift is commonly labelled $V\pi$, and it is well known that $V\pi$ will vary with the applied voltage. At paragraph 34, Risser et al teach precisely this optical response characteristic. Thus: "application of a control voltage V to the linear electro-optic polymer cladding induces a phase shift $\Delta\phi$ in the optical signal propagating through the optically functional region". With reference to FIG. 3, Risser et al teach an embodiment having a linear response, such that "successive equal phase shifts $\Delta\phi$, for example 180°, are induced by successive equal increases in control voltage V". Referring to FIG. 4, Risser et al teach an embodiment having a non-linear response, such that "application of a control voltage V to an electro-optic polymer cladding ... induces successive phase shifts $\Delta\phi$ in the optical signal but successive phase shifts of equal value are induced with progressively smaller increases in the control voltage V .... Thus, in the case of successive phase shifts $\Delta\phi$ of 180°, the magnitude of the successive control voltage increments $V_\pi$ necessary for inducing the successive 180° phase shifts decreases as the magnitude of the control voltage V increases."

However, neither Tavlykaev nor Risser et al teach or suggest how the drive signals should be generated. Tavlykaev's sole reference to generation of the drive signals, is to teach the use of known prior art drivers (see Tavlykaev, Para. 50). Risser et al provides little further information. In fact, the sole description of drive signal generation provided by Risser et al. appears at paragraph 36, thus:

> "Many embodiments of the present invention are likely to benefit from the use of a control signal that comprises a substantially constant bias component and a substantially variable drive component. The bias component would typically be selected to define a magnitude of the response sufficient to enable substantial control of the refractive index of the optically functional region through variation of the drive component. It is contemplated that in some applications the bias component will be at least an order of magnitude larger than the drive component. In still further applications, particularly those where a modulating output signal is desired, the bias component will comprise a DC voltage and the drive component will comprise an AC drive signal. Regardless of whether a separate bias voltage or biasing control signal is employed as a means of controlling an optically functional region according to the present invention, clear advantages are contemplated in the provision of a controller configured to provide the control signals necessary to operate waveguide devices incorporating the optically functional region. Indeed, according to one embodiment of the present invention, the controller is configured to provide an RF control signal and the optically functional region of the cladding ... transitions between a substantially oriented state and a substantially isotropic state at a frequency of said RF control signal. In this manner, the waveguide device is configured to generate an RF modulated optical output signal.

There is nothing in this passage, or anywhere else in Risser et al, that teaches or suggests deriving the branch drive signals $V_L(t)$ and $V_R(t)$ from a stream of successive sample values, much less sample values representative of a desired optical E—field. The mere possibility that one could derive drive signals in this manner suggests neither the desirability of doing so nor how this may be accomplished in practice.

In light of the foregoing, Applicant believes that the cited references fail to teach or fairly suggest the features of the invention as previously claimed. Accordingly, applicant is of a view that no claim amendments are required to properly define over the teachings of the cited references. However, for the sole purpose of clarifying the meaning of the elements defined in the claims, Applicant has amended claims 1 and 11 to define that the "successive samples" are digital samples, and that the samples are representative of In-Phase and Quadrature components of the desired optical E-field. None of the known prior art teaches or suggests these features.

In light of the foregoing, it is respectfully submitted that the presently claimed invention is clearly distinguishable over the teaching of the cited references, taken alone or in any combination. Thus it is believed that the present application is in good condition for allowance, and early action in that respect is courteously solicited.

If any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this response, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 19-5113.

Respectfully submitted,
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March 10, 2005

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